Commission to Study the Relationship Between
Public Health and the Environment.

(HB 1390, Chapter 114, Laws of 2000)

FINAL REPORT

November 1, 2002

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I. EXECUTIVE SUMMARY

The Commission To Study The Relationship Between Public Health And The Environment (hereinafter "Commission") spent 24 months evaluating the science of public health and how public health principals can be best integrated with recent advances in our knowledge of the environment. The Commission listened to testimony from many experts with knowledge about or interest in environmental health; reviewed numerous periodicals, books, and web-based materials; and spent many hours digesting this material in advance of preparing this report. This report summarizes the current state of practice of environment health in New Hampshire and provides recommendations for improving environmental health practice and health outcomes in our state.

The Commission recommends that the General Court renew the Commission in order to help implement the following four initiatives, and to continue to refine its understanding of the complex issues of environmental health in New Hampshire:

- **Improve Public Health Infrastructure**

  The Commission recommends the regionalization of public health departments staffed adequately by public health trained staff for the duel purposes of meeting day-to-day environmental health needs while maintaining the capability to respond to disease outbreaks including food borne illnesses, be they naturally occurring or the result of terrorist acts. Cognizant of the diversity of New Hampshire communities, this regionalization should be at a scale that allows the participating communities to enhance their public health capacity and foster secure and redundant lines of communication between state and local public health entities so as to facilitate the day-to-day flow of business and build emergency response capacity. Funding should be adequate to meet the present and emerging public health needs of these communities.

- **Decrease Hazardous Environmental Exposures**

  New Hampshire citizens continue to be exposed to a wide array of toxics and other hazardous environmental exposures that can affect our health. These include the many issues outlined in Table 2, such as exposure to lead, arsenic, mercury, MTBE, environmental tobacco smoke, and pesticides, as well as other pollutants in outdoor air. The Commission recommends concerted action through legislative support and rulemaking, partnerships, and other actions to mitigate human exposure to these hazards.

- **Undertake Strategic Planning at the State Level**

  Proper planning is critical if the state is to make the best use of the environmental resources at hand, as well as to direct attention to areas where more resources may be needed. This effort should include a state-level environmental health disease

surveillance system designed to convert environmental and health data into information that can be used to identify potential links between environmental conditions and adverse health outcomes.

- **Specific Action to Improve Environmental Public Health**

  While Table 2 identifies many areas to address, the Commission believes that there is one specific initiative that could be addressed initially which provides an opportunity to improve health and reduce costs. That initiative deals with providing an integrated approach to the siting and design of public buildings such as schools, state offices, and libraries. Linking public funding of public buildings to an integrated design approach can provide healthy and productive spaces with features that lower costs to heat, cool, light, ventilate, and maintain the structure, and are accessible by walking and biking as well as by vehicles. New Hampshire has the opportunity to provide leadership in this area.

  Through its deliberations the Commission finds that there has been no single "golden era" of public health, although there have been times when the evolution of environmental public health has progressed at greater or slower rates. Environmental health tools have evolved over the years and now include isolation, quarantine, sanitation, vaccination, diagnosis, and education. As social beings, the future of humanity will always be linked to environmental public health, be it in the maintenance of sanitary conditions to check the spread of contagious disease or in learning about healthy lifestyles. Public health is not a battle that is fought once and won, but rather it is a continuous cycle of diligence and renewal of commitment to healthy communities and healthy environments that links one generation to the next.

II. INTRODUCTION

For centuries, health and environmental professionals have created systems to track and manage community disease, remove dangerous wastes, and provide safe food, water and fresh air. (*See Appendix A for a brief history of the field of environmental health*). In fact, such a good job has been done in preventing devastating epidemics that in some instances the public and community leaders have begun to value this work less. This is unfortunate, given that our environmental health system is failing to keep up with important societal changes like rapid urbanization, new pollutants, emerging diseases, and acts of bioterrorism. For better or worse, each year there are more people, more pollutants and more threats that need to be addressed in order to ensure the health of the citizens of our state.

To help place these and other risks in perspective, a Comparative Risk Project was undertaken in the mid to late 1990's to delineate the risks to the health of the New Hampshire population and the ecological risks to the environment. Top health risks included particulate exposure, lead poisoning, indoor air quality, and sunlight exposure.

For the ecological risks, the loss of land and increased urbanization were major issues. It is important to note that the top public health risks are all environmental health risks as well.

Shift from a disease-based model to a wellness-based model

The increasing life span enjoyed by many due to the general control of childhood illnesses resulted in a fundamental public health strategy shift from reducing infectious disease burden to reducing the incidence of conditions more typically associated with ageing, such as cancer, cardiovascular disease, and diabetes. With an age structure now tilted more towards older individuals, the next generation of public heath practitioners had to rethink its approach to primary prevention. While public health practitioners have had tremendous success with society-based interventions such as municipal water supplies and control of some environmental hazards, there has been less success in facilitating lifestyle changes such as combating obesity or controlling the use of tobacco or intoxicants. It has been said that it is not good enough to impart knowledge, what counts is what is done with that knowledge. Facts notwithstanding, human behavior and group dynamics are major drivers of lifestyle decisions, and health education will need to align itself more with the social sciences and marketing specialists if words are to progress on to deeds.

Definition of Environmental Health

An environmental health system ideally focuses on protecting the health of the community, rather than providing health care to individuals. The search for patterns of illness on a whole town level (surveillance) is analogous to how a physician might examine an entire body. As with every rule there are exceptions; for example, the management of lead poisoned children and assistance to other individuals with specific illnesses that need environmental interventions (i.e., asthma, allergies, etc.).

The World Health Organization defines health as a state of physical, mental and social well-being and not merely the absence of disease or injury. Congruent with this definition is a definition of environmental health provided by the Johns Hopkins Bloomberg School of Public Health:

> *Environmental health comprises those aspects of human health, including quality of life, that are determined by interactions with physical, chemical, biological and social factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that may adversely affect the health of present and future generations.*

More succinctly, environmental health and protection is the art and science of protecting against environmental factors that may adversely impact human health or the ecological

balances essential to long term human health and environmental quality.[1] As with the WHO's wellness perspective of health, these definitions imply not only a need to respond to existing threats but the importance of a preventive, proactive approach to mitigate future risks that can impact health.

Mission of the Commission and the Purpose of this Report

While the study of disease epidemics may seem to many as of historical interest only, this is not the case. HIV and West Nile Virus (WNV) are two recent examples of diseases that required the deployment of public health resources, and it seems inevitable that other diseases requiring a public health response will appear over time. Easy access to technology raises the possibly that terrorists could acquire “designer diseases” from which there is no protection, or simply deploy existing diseases such as small pox. All of these realities and possibilities underscore the essential need to maintain the traditional public health defense system. But, against this background, the field of environmental public health must also take notice of and respond to more chronic illness and diseases caused by or mediated by environmental factors.

It is with the above understanding the Legislature established this Commission. The charge of the Commission is to complete a study that “shall include, but not be limited to the scope of medical and public health practices as they relate to environmental exposures such as, but not limited to: indoor and outdoor air pollution; lead and other heavy metals; food contamination; drinking water contamination; radiation; pesticides; and other public health risks identified by the New Hampshire Comparative Risk Project.” The rest of this report is dedicated to this effort.

III. AREAS OF INVESTIGATION

To gain a more complete understanding of these complex issues, the Commission invited experts in a wide variety of issues to brief them. Fifteen technical sessions were convened between August 2000 and January 2002, to address the issues outlined in Table 1.

Table 1.
Presentations Made to the Commission to Study the Relationship Between Public Health and the Environment

DATE	TOPIC	PRESENTERS
#1 7/25/00	Organizational meeting	[After Commission formed in July, 2000]
#2 8/28/00	Environmental Health: Intersection of Public Health and Environment	Tim Soucy, Manchester Health Dept.
#3 9/25/00	Comparative Risk Project Illness to Wellness model	Robert McLellan and Kate Hartnett, Jordan Institute
#4 10/23/00	Sludge	Richard Flanders, DES
	Healthy NH: 2010	Gwen Grossmiller, DHHS
	Smoking	Lynn Brownell, NH Lung Assoc/ALA
	Turning Point	Jon Stewart
#5 11/27/00	Status of legislation	Joel Anderson, House Committee Research
#6 1/22/01	Relationship between DES and DHHS, Div of Public Health Services	Ken Colburn, DES Brook Dupee, DHHS
#7 3/5/01	Outdoor Air	Rick Rumba, NHDES Air Resources
#8 3/26/01	Indoor Air (Tools for Schools)	Rick Rumba, DES & Sandy Chabot, NH Cmte on Occupational Safety & Health
	Pulmonary Disease	William Goodman, M.D.
#9 4/30/01	Food Contamination	Joyce Welch, DHHS
#10 6/11/02	NH Dioxin Strategy	Rick Rumba, DES
	Persistent, bioaccumulative toxins (PBTs) & persistent organic pollutants (POPs)	Deb Augustine, Foundation for Healthy Communities & Laura Brannen, Health Care Without Harm
#11 7/30/01	Tobacco Settlement	Lynn Brownell, NH Lung Assoc/ALA
	Env. Importance of Forests & purchase of 171,000 acres of International Paper land	Jason Stock, NH Timberland Owners
#12 8/27/01	NH State Cancer Registry	Jennifer Taylor, DHHS
	Pesticides and Children	Debra Martin, The Jordan Institute
#13 9/24/01	Primary Prevention for Public Health and Toxics Use Reduction	Karla Armenti, Univ. of Lowell Toxics Use Reduction Institute
#14 10/30/01	Epidemiology / Bio-terrorism	Drs. Tom Sink & Michael Gregg, CDC
#15 12/17/01	4 pollutant bill (HB 284)	Joe Fontaine, DES
#16 1/28/02	Asthma	Rick Rumba, NHDES ARD & NH coalition & NE Regional Asthma Council
#17 3/4/02	Planned discussion of draft recommendations from members	

IV. CURRENT STATE OF ENVIRONMENTAL HEALTH PRACTICE IN NEW HAMPSHIRE

New Hampshire can cite a number of success stories that foster environmental health in the state and many of these illustrate the power of public and private sector partnerships:

• *The voluntary Environmental Tobacco Smoke (ETS) efforts*
Currently, over 15 anti-tobacco coalitions are using portions of these funds to promote anti-tobacco education throughout their communities in NH. Many communities are working diligently to implement and/or reinforce anti-tobacco policies in local businesses, including restaurants and schools.

Optimistically, NH has seen a significant drop in the youth smoking rate since these anti-tobacco efforts have been in effect over the past two years. Through allocating the settlement dollars toward tobacco prevention and control, NH anti-tobacco agencies and coalitions will have more funding to continue the fight.

• *Promotion of "healthy" medical products with special emphasis on the awareness of products containing phalates:*

The NH Hospitals for a Healthy Environment (NH3E) is a network of hospitals working to reduce the volume and toxicity of their waste -- including the persistent bioaccumulative toxics (PBTs) associated with the incineration of medical products containing mercury and polyvinyl chloride (PVC). NH3E has also been educating its members about a substance used in PVC medical products called DEHP (di-ethylhexyl-phthalate). It is a developmental and reproductive toxin that can leach from intravenous (IV) tubing and bags exposing critically ill infants and other vulnerable patients to unsafe amounts of it. In June 2002, nearly every hospital was represented at a workshop in Concord to learn more about PVC and alternative purchasing options.

Many of New Hampshire's hospitals have formally signed on to the Hospitals for a Healthy Environment program, a national effort of hospitals and other health care providers working to virtually eliminate mercury by 2005, cut waste volume by 50% by 2010, and prevent pollution from PBTs and other hazardous chemicals.

• *Food Protection Initiatives*

Food borne illness in the United States is a major cause of personal distress, preventable death and avoidable economic burden. It is estimated that food borne diseases cause approximately 76 million illnesses, 325,000 hospitalizations and 5,000 deaths in the US each year. For many victims, food borne illness results in lost time from work or major discomfort. For highly susceptible populations such as the immunocompromised, preschool children or older adults, food borne illness is more serious and may be life threatening. The estimated annual cost of food borne illness in terms of medical costs, reduced productivity, and pain and suffering is between $10 and $83 billion. Factors

which contribute to the increase in food borne illness include changes in diet, new methods of food production, new infectious agents and ever-increasing at-risk populations. From the “farm to the table” there are numerous environmental factors that can affect the safety of the food supply including air, soil, water, animals, rodents, insects, ingredients, packaging materials, transport methods, contact surfaces, and food handlers.

The Commission learned of the efforts of the New Hampshire Department of Health and Human Services Bureau of Food Protection (BFP) to protect the food supply and prevent food borne illness in New Hampshire. The BFP is the state agency responsible for licensing and inspecting approximately 5,000 retail food establishments, dairy farms, milk and bottled water plants, and commercial shellfish processors.

• *Promotion of School IPM (Integrated Pest Management)*

In an effort to decrease children's exposure to toxic pesticides, The Jordan Institute is partnering with the University of New Hampshire's Cooperative Extension and NH Department of Agriculture to promote School IPM using a strategy of broad-based education and specific training of school personnel. This partnership also extends to the states of Maine and Vermont through an EPA Environmental Stewardship grant.

• *Non-toxic vegetation management of power line right of ways by New England Power Company and PSNH*

New England Power Company, a subsidiary of National Grid USA, has an extensive vegetation management program that promotes the growth of thick shrubs and grasses, which discourages the establishment of tree species that might otherwise require herbicides to control.

Public Service Company of NH uses sheep to control vegetation on a small percentage of its power lines.

• *NH Minimum Impact Development Partnership*

The Jordan Institute has convened a public private partnership of development experts and natural resource and public health scientists to define and encourage good development in New Hampshire. “Good” development is cost-effective buildings and sites providing healthy and productive spaces that are comfortable and durable, and reduce operating and maintenance costs. The partnership believes that new standards for good development promote economic vitality and quality of life while allowing for growth

V. VISION OF THE FUTURE

Strategic Planning for Environmental Health

The system of environmental health protection must be strengthened in order to keep up the traditional needs and emerging threats. We can only do this if the public ant environmental health leaders know what we do and how valuable the services are. Our job is to clarify the role of environmental health in the lives of New Hampshire citizens, and strengthen the ability of environmental health practitioners to do their work well. The objectives associated with the environmental health planning effort are to:

- Identify federal, state, and local environmental health resources in New Hampshire
- Bring together stakeholders to develop a shared vision of environmental health practice in NH
- Communicate the results of the planning effort to advocates, business, the legislature, the media, and to the public at large
- Implement the plan, including provisions for periodic review to make sure the plan reminds valid and effective.

Improve Local Public Health Infrastructure

Much of the work to date in improving local public health infrastructure in our state has been funded by the Robert Wood Johnson Foundation and the W. K. Kellogg Foundation. These demonstration projects were funded with the intention of strengthening the United States public health system by promoting better integration of diverse fields within public health. The program emphasizes community collaboration and participation of community organizations involved with public health that might not typically be included in public health such as housing and faith-based organizations. There are 23 states that participate in the Turning Point program.

New Hampshire has received implementation funding which supports four coalitions to develop public health infrastructure for defined geographic regions covering 39 towns and cities. The four Turning Point community coalitions are the North Country Health Consortium, centered in Littleton; the Cardigan Health Board, located in Canaan; Greater Derry Community Health Services; and The Caring Community Network of Twin Rivers, in Franklin.

Each of the coalitions began with a community public health needs assessment based on the ten essential services. They are now using the results of the needs assessment to implement various activities that address public health issues in their region. Since the events of September 11, 2001, each of the sites has taken on public health emergency response as a priority issue. The coalitions have used different strategies for accomplishing their goals. Some used funds to hire a coordinator to work with the group,

others added funding to existing programs. In each case, the coalitions adopted a model and addressed issues specific to the needs of their region. New Hampshire also participates at the State level in two National Excellence Collaboratives; one examining how state health agencies measure and manage public health performance, and the other exploring information technology systems for state health agencies.

The objectives associated with local public health infrastructure are to:

- Facilitate the formation of regional public health departments staffed by trained personnel.

- Develop standards and certification criteria for local health officers.

- Review the state's public health laws to ensure they are comprehensive, fair, and easily understood.

- Support enhanced disease surveillance programs at the state level with timely feedback to communities.

- Promote activities that foster interaction among governmental agencies and other stakeholders with public health expertise: e.g., disease surveillance of respiratory diseases with linkages between DHHS, DES, DOE, and nonprofit public health agencies.

- Educate communities as to the importance of public health services.

- Support the development of training programs for physicians in environmental health.

Environmental Health Communications (Health Alert Network)

The Health Alert Network (HAN) is a nationwide, integrated information and communications system serving as a platform for distribution of health alerts, dissemination of prevention guidelines and other information, distance learning, national disease surveillance, and electronic laboratory reporting, as well as for CDC's bioterrorism and related initiatives to strengthen preparedness at the local and state levels.

With federal assistance the DHHS Office of Community and Public Health (OCPH) is expanding the capabilities of the HAN. The recently purchased Communicator, (a hardware/software system that is capable of sending and receiving information in multiple formats, only one of which is internet-based) was installed and tested in early October. The Communicator will assist with both surveillance and emergency response needs by allowing OCPH to contact multiple persons at multiple hospitals through telephone, fax, cell phone, and email. Over time, this system will be made available to

other State departments and community organizations as a communications utility for local health alert and other communications needs.

The objectives associated with the HAN are to:

- Identify the flow path of information from local public health organizations to the state and from the state to local public health organizations.

- Identify key stakeholders who will be receiving information via the HAN.

- Test the HAN system by participating in drills and mock disaster scenarios.

Environmental Public Health Surveillance System

The State of New Hampshire is initiating a collaborative effort between the NH Department of Health and Human Services (DHHS) and the NH Department of Environmental Services (DES) to jointly create an environmental public health tracking system. Though this initiative, DHHS and DES propose to build strong and lasting links between the people, programs, and databases that focus on environmental health issues in the Granite State. We envision a modern surveillance system that is capable of rapid and accurate environmental health reporting and is designed from the ground up to communicate with national data collection and surveillance efforts. The result will be a system that provides the information we need to make informed decisions, create better policy, and improve human health both in New Hampshire as well as nationally. This significant grant opportunity will allow DHHS and DES to continue and expand an already positive working relationship and to improve and integrate essential public health and environmental data systems, with the ultimate goal of providing a healthy environment for all New Hampshire citizens.

The objectives associated with Environmental health surveillance system are:

- Create a statewide work plan for an environmental health tracking network that will allow New Hampshire to identify, track, and classify illnesses of an environmental origin.

- Using the work plan as a guide, develop the environmental health tracking system by establishing and integrating existing disease, exposure and environmental database systems.

- Invite NH stakeholders to participate in an environmental public health surveillance working group to identify statewide environmental health tracking priorities.

- Develop and implement environmental health surveillance programs for priority initiatives to create comprehensive environmental health profiles for the state. Using

these profiles, establish a system for integrating statewide data for researching other environmental health issues.

Human Biomonitoring Planning

Biomonitoring is defined as the assessment of individual human exposure by measuring environmental chemicals directly in human body fluids and tissues; measuring the "internal dose". Lead is an example of biomonitoring that is routinely performed. Currently environmental exposures are assumed based on the known presence of the toxicant in the environment or by doing animal studies. These methods may under- or over-state actual human exposure. Human biomonitoring will add valuable data to the exposure assessment process, assist New Hampshire lawmakers and officials in setting priorities for addressing environmental problems and provide data for the new environmental health surveillance system to be developed.

The OCPH Public Health Laboratories, through a federal grant, has convened a group of New Hampshire professionals with interest and expertise in environmental public health to develop a plan for a human biomonitoring program for New Hampshire. Funding will also allow the Public Health Laboratories to assess its current capacity and identify gaps in its ability to provide the biomonitoring of importance to the State. Biomonitoring projects under discussion include MtBE; arsenic, mercury, uranium, and other heavy metals; pesticides and herbicides; PCB's; dioxins; cotinine, and others. The plan, with the input of many environmental public health professionals, will serve as a roadmap for determination of the body burden of priority toxicants in New Hampshire citizens and will be used to apply for additional federal funding to implement the program. Any laboratory infrastructure enhancement will also improve the capacity and capability to respond to a chemical terrorist attack since the same equipment and staff expertise is needed for both purposes. The objectives associated with the Human Biomonitoring Program are:

- Develop partnerships among environmental public health professionals to determine state environmental health priorities that lend themselves to human testing to determine body burden
- Create a valid data source for the new environmental health surveillance system to allow the linking of environmental hazards to body burden.
- Improve capacity and capability to detect and respond to a chemical terrorist attack

Opportunities for Improvement - Program Specific Initiatives

While the Commission has paid particular attention to crosscutting initiatives such as those listed above, there are also many program-specific actions that were identified as in need of addition resources and support. These program specific initiatives are listed in Table 2. Yet, despite these positive interventions, there is also an absence of a long term, preventative perspective limiting the state's ability to meet emerging needs.

Table 2.
Program Specific Initiatives Identified by the Commission

Current and Emerging Needs	Legislative/Policy Initiatives	Partnership Building	Proposed Activities
Terrorism	Assure adequate funding for state and local public health programs that address the threat of chemical, radiological, and biological terrorism. Support adequate funding of state and local programs that increase the state's capacity to respond to chemical, biological, and radiological terrorism.	Outreach to public health professionals, health care providers, first responders, and the public to improve awareness of the risks posed by terrorism and the means by which they can respond. Encourage state agency Participation on the Governor's Bioterrorism Commission.	Create a state-level clearing house for public information concerning the state's ability to respond to acts of terrorism. Promote comprehensive participation by state agencies, local responders, hospitals, and federal agencies in drills and exercises.
Food Safety	Support increased food inspection capacity through the funding of additional food inspectors. Require mandatory food manager certification. Require temporary establishments (e.g., local fairs) to be licensed and inspected for food safety.	Utilize and expand partnerships between state agencies (eg. NH Bureau of Food Protection, NH Department of Agriculture, UNH Cooperative Extension), self-inspecting communities and representatives from the food service industry (eg. NH Lodging and Restaurant Association, NH Grocers Association) and the NH Safe Food Alliance.	Educate food service workers and consumers. Strive for uniformity in the regulation of the food service industry statewide
Indoor Air Quality and Public Buildings Performance	Require public buildings, including schools, to be certified annually for adequate indoor air quality. Strengthen the laws that govern air quality in state owned buildings. Require schools to be built to new codes that will mandate adequate ventilation for all indoor spaces to decrease the likelihood of respiratory diseases. Update school facilities to keep ventilation at a minimum of 20 CFM per person. Tie state school building aid to participation in a recognized program designed to provide high	Work with the Office of Energy and Cmty. Services programs such as Rebuild America, to build High Performance Schools Continue partnering with initiatives such as the Minimum Impact Development Partnership to encourage good development practices for public buildings	Train public Health Officers to respond to residential calls for indoor air quality assistance. Make available Indoor Air Quality (IAQ) training aids such as "Tools for Schools" to school facility mangers. Coordinate the development of standards for building buildings with HB 329 study committee.

Indoor Air Quality and Public Buildings Performance (continued)	performance buildings and good ventilation. Develop a program for mold abatement similar to the lead abatement requirements required under RSA 130-A. Clarify legislative intent that RSA 200 is meant to include the ability of DHHS to intervene in schools in extreme situations where the health of the students and staff is at risk. Continue HB 329 Study Committee on indoor air quality and fire safety in public schools.		Study how indoor and outdoor air quality issues can be better linked, addressed and regulated.
Decrease Exposure to Toxic Substances	Support pollution prevention activities/ initiatives with adequate funding.	Promote activities that foster interaction among government agencies and other stakeholders that influence public health.	Promote research to fill data gaps on human exposure: e.g., the OCPH Biomonitoring Program.
Persistent Bioaccumulative Toxic materials; Persistent Organic Pollutants	Develop and thereafter adequately fund the biomonitoring capacity of the OCPH Biomonitoring Program.	Utilize and expand partnerships between state agencies and non profit organizations to reduce the volume and toxicity of their wastes.	Education of health care providers / organization re: Alternative purchasing options to favor less toxic materials.
Pesticides	Promulgate regulations requiring the use of Integrated Pest Management (IPM) practices in schools.	Enhance education between state agencies, schools, and private organizations as to the proper use and disposal of pesticides, including less toxic alternatives.	Collation of the state database on the amounts and location of pesticide application Education of School personnel re: IPM.
Mercury	Consider legislation to test farm fish for mercury.		Increase awareness of the dangers of mercury in fish through the education of the public and of health care providers.
Dioxin	Legislation to build upon dioxin reductions required by RSA 125-N	Coordinate with DES, DHHS, Dept. of Ag, NH dairy industry to coordinate public outreach and education re: dioxin exposures.	Education of public re: backyard trash burning. Education of health care providers/ organization re: PVC plastics and alternative purchasing options
Lead	Appropriate additional funds to increase screening of young children for lead poisoning. Appropriate additional funds for lead abatement, and expand this coverage to include private	Utilize and expand partnerships between state agencies, grass roots organizations, local health entities, and HUD to help reduce conditions in older	Increase screening in Medicaid children through increased education of both parents and health care providers.

Lead (continued)	residences.	housing that are conducive to lead poisoning.	Education of rental and private homeowners of the dangers of lead paint and educate in safe abatement methods.
Arsenic	Require private well testing at real estate transfers.	Continue the work of the Arsenic Consortium in educating the community as to the dangers associated with arsenic exposure.	
Radon	Consider requiring testing for radon in air and in well water at real estate transfers.		
Environmental Tobacco Smoke	Use the tobacco master settlement agreement funds received by the state ($46M in 2002) for the public health purposes for which they were intended. Support smoke free dining legislation.	Continue collaboration between state agencies, non-profit organizations, local coalitions, and health care providers to protect the Tobacco Use Prevention Fund.	Increase funding for the state Comprehensive Tobacco Control Program.
MTBE			Research into other oxygenates for gasoline. Educate to decrease gas consumption.
Outdoor Air Pollutants	Support school bus anti-idling legislation. Support Legislation to reduce emissions of air pollutants that present the greatest treat to public health from all stationary and mobile sources. Initiate local and state policies that support bus managers in purchasing cleaner bus technology and/or fuels.	Improve partnerships between DHHS and DES to work on decreasing exposures to outdoor air pollutants and issuing air pollution health advisories.	Support research efforts on health implications of air pollutants, environmental transport, and air pollution health advisories.

VI. RECOMMENDATIONS FOR CHANGE

A fundamental paradigm shift is needed from the present reactive and illness oriented model to one that is proactive and focused on prevention and wellness. The State Legislature took an important first step when it passed a resolution ordaining public health a core value in New Hampshire (See Appendix: SCR 3). However, without an improved infrastructure, including the concomitant capacity to meet both current and emerging needs, this step is only symbolic. Only through legislative and policy initiatives, public and private partnerships, and by addressing our knowledge gaps through research and education can New Hampshire increase its capacity to protect the public's health by improving the practice of environmental health. Therefore, based upon the input from many individuals and organizations as well as the result if its own deliberations, the Commission sets forth the following recommendations:

- Undertake strategic planning at the state level so as to best use the environmental resources at hand as well as direct attention to areas where more resources may be needed.

- Support the growth of regional public health departments adequately staffed by public health trained staff for the dual purposes of meeting day to day environmental health needs while also maintaining the capability to respond to disease outbreaks, be they naturally occurring or the result of terrorist acts. Cognizant of the diversity of New Hampshire communities, this regionalizing should be at a scale that allows the participating communities to enhance their public health capacity, including secure and redundant lines of communication between state and local public health entities so as to facilitate the day-to-day flow of business and build emergency response capacity.. Funding should be adequate to meet the present and emerging public health needs of these communities.

- Develop and maintain a state-level environmental health disease surveillance system by bringing together disease surveillance system specialists, environmental health practitioners, information technology experts, and the state's environmental agency for the common purpose of converting environmental and health data into information that can be used to identify potential links between environmental conditions and adverse health outcomes.

- Decrease human exposure to toxic substances. New Hampshire citizens continue to be exposed to a wide array of toxics that can affect our health. These include exposure to lead, arsenic, mercury, MTBE, environmental tobacco smoke, and pesticides, as well as other pollutants in outdoor air. The Commission recommends concerted action through legislative support and rulemaking to mitigate our exposure to theses toxics.

- Link the public funding of public buildings, including schools, to the performance of the building to ensure that the design and construction/rehabilitation of these buildings is truly cost effective. The Commission discussed projects such as the Health and Human Services Building and Beaver Meadow School in Concord, and the Rockingham County Courthouse as examples that demonstrate the opportunity to improve the building contracting process. In each of those cases, ventilation and other systems had to be substantially modified after occupancy, at significantly higher cost than during construction. Such problems also have caused significant lost time and lowered productivity over years prior to correction.

- Support the specific program improvements as contained in Table 2.

- Continue the work begun by the Commission to improve the image and visibility of environmental health.

Appendix A – Supplemental Information on Environmental Health in New Hampshire

History of Environmental Health

The Greeks were the first to make the connection between health and environment, and coined the terms endemic (meaning always present) and epidemic (meaning excessively frequent). A sentinel work, *Airs, waters, and places,* authored by Hypocrites, was the foundation of public health thinking up until the age of bacteriology and immunology.

The Middle Ages saw a decline in public health practices as embodied by Greece and Rome. Not without reason were the Middle Ages also known as the Dark Ages. Much of the medical knowledge gained in Grecian times was either lost or forgotten, and as a consequence disease was largely understood only on religious or magical terms. In a similar vein, public health improvements such as piped water, latrines, heat, and ventilation mainly survived in institutions such as monasteries.

The following centuries brought the Renaissance, the Age of Enlightment, and the beginnings of the Industrial Revolution. Overcrowding of cities caused by industrialization placed increasing pressure on public health systems, which in tern lead to increasing injury and death rates. Public outcry about this situation slowly led to advances in sanitation. Although by 1830 the initial era of industrial expansion closed with many public health improvements in place, the root origins of disease remained elusive and would not be fully understood until the bacteriological era.

As was the case in England, public health policy in the United States was strongly influenced by periodic mass disease outbreaks throughout the 1800's. Epidemics of yellow fever, cholera, small pox, typhoid fever, and scarlet fever kept the public's attention focused on public health. As in England during earlier times, a flood of immigrants looking for an improved quality of life led to the failure of basic sanitary systems in American cities and the recurrence of disease. In response to the pressure to improve the health of the public, New York City created the first municipal Board of Health in 1798. For the first 10 years public health employees worked as a branch of the Police Department, which underscored the connection between code enforcement and proper sanitation. Enforcement of sanitary laws was added to the list of public heath interventions.

At the state level, Massachusetts created the first state health department in 1869. Other states followed the lead of Massachusetts, with New Hampshire being the 27th state to do so in 1881. At the national level Congress followed England's lead by creating in 1879 a National Board of Health. Although the National Board of Health was defunded 12 years later, the Marine Hospital Service (MHS), originally created to attend to the medical needs of sailors, continued on from 1798 to 1902. Along the way Congress reorganized the MHS from a loose collection of regional hospitals to a central agency headquartered in Washington. The goal was to create a cost-effective, professional, mobile, health corps, free as possible from political favoritism and patronage, and able to study and control epidemics. The MHS was successful in this mission, and over time evolved into the US Public Health Service we know today.

The late 1800's and early 1900's saw another fundamental public health intervention. The general acceptance and application of the germ theory of disease resulted in the basic elimination of yellow fever, typhoid, diphtheria, and malaria in the United States. Contagious disease once only controlled through sanitation, isolation, and quarantine could now be targeted in a more specific way. This advance added considerably to the life span of the average person, and totally reshaped the age structure of the industrial nations.

In recent times there have been few developments as dramatic an impact on the discipline of public health as the evolution of the computer. Within a span of 30 years computers have progressed from large electromechanical machines that placed limited computational power in the hands of a few to powerful minicomputers that are affordable today by almost every public health practitioner. The creation of the Internet has allowed for the linkage and analysis of data sets at a level that was practically impossible just a few decades ago. These advances in data storage and computational power provide the tools to refine our knowledge of environment and disease, and how the former can be enhanced to prevent the latter. However, with this power to analyze comes the responsibility to protect the rights of personal privacy.

State Agencies Involved in Environmental Health Issues

There are a number of state agencies in New Hampshire with statutory authority relevant to environmental health. These agencies, their statutory basis, and their primary mission are summarized in the table below:

State Agency	**Statutory Authority**	**Mission**
Department of Health and Human Services, (DHHS) Office of Community and Public Health	RSA 132:11, RSA 132:12, RSA 141-C, RSA 126-P, RSA 141:F, RSA 132:12, RSA 141-B, RSA 128-K, RSA 126-I, RSA 186:67A, RSA 154:64-77, RSA 126-K:15, RSA 126, RSA 290, RSA 457, RSA 459, RSA 127, RSA 128, RSA 147, RSA 131, RSA 141-F, RSA 265, RSA 184, RSA 130-A, RSA 442, RSA 611, RSA 125-F:1-25, RSA 107-B, RSA 125-B:1, RSA 125:77 b, RSA 125-H, RSA 10-B, RSA 141-E, and RSA 125:9.	To assure the health and well being of communities and populations in New Hampshire by protecting and promoting the physical, mental and environmental health of its citizens and by preventing disease, injury and disability
DHHS Office of Program Support	RSA 130, RSA 143, RSA 143-A, RSA 146, RSA 145, RSA 146, RSA 184	The mission of the Bureau of Food Protection is to protect the NH food supply and prevent food borne illnesses
Department of Environmental Services, (DES) Air Resources Division	RSA 125-C, RSA 125-D, RSA 125-I, RSA 125-J, RSA 125-L, RSA 125-M, RSA 125-N.	Achieve maximum reductions in emissions of pollutants that pose the greatest risk to public health and the environment, as quickly as possible, and as cost-effectively as possible.

DES Waste Management Division	RSA 146-A through G, RSA 147 –A through F.	The Waste Management Programs deal with the current and future issues associated with solid and hazardous waste outreach, compliance, enforcement, grants, permitting and reporting. The Site Remediation Programs focus on correcting past mistakes by following standards of various programs to clean up property contaminated by petroleum and other waste,
DES Water Division	RSA 481, RSA 482-A through B, RSA 483-A through D, RSA 484, RSA 485-A through D, RSA 486, RSA 487.	To ensure that New Hampshire's lakes and ponds, rivers and streams, coastal waters, groundwater and wetlands are clean and support healthy ecosystems, provide habitats for a diversity of plant and animal life, and support appropriate uses.
Department of Agriculture, (DOA) Pesticide Control Division	RSA 430:1 to 57	To promote agriculture in the public interest and to serve farmers and consumers in the marketplace.
Attorney General's Office	See AGO Environmental Protection Bureau for complete listing (http://webster.state.nh.us/nhdoj/Environmental.html)	To prosecute civil and criminal violations of New Hampshire's environmental laws and provide legal advice and representation to the state agencies which oversee the environment and natural resources in New Hampshire.

Local Environmental Health Agencies

In addition to state agencies, there are local health entities with levels of skill ranging from the Manchester Health Department at the high end to the small towns without an appointed health officer at the lower end. These agencies, their statutory basis, and their primary mission is summarized below:

Local Agency	**Statutory Authority**	**Mission**
Manchester Health Department		
Nashua Health Department		
Self Inspecting Towns		
Small towns with health officer		
Small towns w/o health officer		

Federal Environmental Health Agencies

There are a number of federal agencies operating in New Hampshire with statutory authority at the federal level that is relevant to environmental health. These agencies, their statutory basis, and primary mission is summarized below:

Federal Agency	**Statutory Authority**	**Mission**
Food and Drug Administration	See the FDA website for Legal authority (http://www.fda.gov/).	The FDA Division of Federal-State Relations (DFSR) is one of four work units within the Office of Regional Operations, Office of Regulatory Affairs, Food and Drug Administration. The Division participates in cooperative and educational efforts designed to inform industry, health professionals, and the public about FDA's functions and its commitment to safeguard the public health. DFSR interacts with, and serves as the focal point for cooperating state and local officials, and associations of these state officials, to promote cohesive and uniform policies and activities in food and drug-related matters.
Environmental Protection Agency		Protecting human health is an integral part of EPA's mission. EPA conducts numerous research programs throughout the world that study the effects of pollution on the human body. Monitoring environmental quality also plays an important role in protecting human health. EPA works with state and local agencies, as well as volunteer and other citizens groups, to monitor air and water quality and to reduce human exposure to contaminants in the air, land, and water.
US Department of Agriculture	See USDA website for statutory authority. http://www.usda.gov/	USDA Mission: Enhance the quality of life for the American people by supporting production of agriculture: • ensuring a safe, affordable, nutritious, and accessible food supply • caring for agricultural, forest, and range lands • supporting sound development of rural communities • providing economic opportunities for farm and rural residents • expanding global markets for agricultural and forest products and services • and working to reduce hunger in America and throughout the world.

Not for Profit Organizations

New Hampshire is fortunate in that there are a number of nonprofit organizations who possess valuable expertise in environmental health. These organizations, together with their primary mission, is summarized below:

Organization	**Mission**
The Jordan Institute	Partnering for healthy people in a healthy environment
NH Safe Food Alliance	The mission of the NH Safe Food alliance is to ensure the safest food possible to protect the health of all consumers.
Foundation for Healthy Communities	The mission of the Foundation for Healthy Communities is to improve health and health care
American Lung Association of New Hampshire	
American Cancer Society	
American Health Association	
NH Public Health Association	

Appendix B - Supplemental Information on Issues Examined By the Commission

Persistent Bioaccumulative Toxics (PBTs) and Persistent Organic Pollutants (POPs)

PBTs and POPs are persistent in the environment and resist degradation through physical, chemical, or biological processes. They do not dissolve readily in water. They do, however, dissolve easily in fats and oils and bioaccumulate in fatty tissues of living organisms. In the environment, concentrations of these substances can increase by factors of many thousands or millions as they move up the food chain.

Some PBTs in extraordinarily small amounts can disrupt normal biological functions, including the activity of natural hormones and other chemical messengers, triggering a cascade of potentially harmful effects. They have the ability to travel long distances, to transfer rather easily among air, water, and land, and to linger for generations. PBTs are semi-volatile and they evaporate relatively slowly. Persistent substances with this property tend to enter the air, travel long distances on air currents, and then return to earth. The colder the climate, the less PBTs/POPs tend to evaporate, resulting in their accumulation in regions such as the Arctic, thousands of kilometers away from their original sources. Exposures to PBTs occur through the food supply, inhalation or dermal contact.

Effects can be highly pronounced in those whose diets include large amounts of wild food and especially big fish, marine mammals and other aquatic resources. When humans consume contaminated fish, meat and dairy products, they receive the bioaccumulative dose of PBTs the animal incurred over its lifespan. Ordinary domesticated meat and milk products can also be significantly contaminated by POPs that travel long or short distances on air currents, settling on pastures where livestock graze.

Human exposures to PBTs can cause:

- Cancers and tumors at multiple sites
- Neuro-behavioral impairment including learning disorders, reduced performance on standard tests and changes in temperament
- Immune system changes
- Reproductive deficits and sex-linked disorders
- A shortened period of lactation in nursing mothers
- Diseases such as endometriosis (a painful, chronic gynecological disorder in which uterine tissues grow outside the uterus), increased incidence of diabetes, and others.

Evidence suggests that women, infants, and children are especially vulnerable to certain effects of PBTs. Maternal body burdens of PBTs are transferred through the placenta to the developing fetus and through breast milk to the nursing infant, and can cause injury at vulnerable stages of development that may not be expressed until the infant reaches puberty or adulthood.

DIOXIN: Dioxin is a byproduct of the combustion of fuels and waste, including medical waste, as well as certain chemical processes and paper manufacturing methods. It is a potent toxin at very low-levels of exposure, and has a half-life of approximately 7 years in humans.

A single very small dose (less than one-millionth of a gram per kilogram of body weight) on day 15 of pregnancy in the rat causes decreased sperm count, delayed testicular descent, and feminized sexual behavior in male offspring. (Mably et al., 1992 Toxicology and Applied Pharmacology Vol 114: 97-126)

The U.S. EPA's 2000 DRAFT Dioxin Reassessment estimates that the average levels of dioxin in all Americans is "at or approaching levels" where we can expect to see a variety of health effects. The EPA also estimates that adults consume 300-600 times the daily "safe" dioxin intake levels set by the Agency, while children consume 50 times more than the "safe" adult levels. In short, although much progress has already been made, Americans have reached maximum thresholds of dioxin, making it a public health necessity to stop dioxin pollution at its sources.

The U.S. Dept. of Health and Human Services, National Toxicology Program has recently determined that dioxin is a known human carcinogen.

Human Health Effects of Dioxin:

- Cancer: Increased cancer mortality overall
- Neonatal Abnormalities: Change in sex ratio, altered level of thyroid hormone
- Skin Disorders: Porphyria cutanea tarda, Chloracne
- Immune System: Change in immune system parameters / modulation
- Endocrine System: Low levels of testosterone, increase glucose intolerance or diabetes, decreased estrogen & estrogen-receptor levels after fetal exposure

MERCURY: An estimated 243 tons of mercury is produced from human activity in US annually. Approximately 85% of this estimate originates from combustion point sources including medical waste incinerators (10%), municipal waste incinerators (18%), coal-fired utility power plants (33%) and industrial boilers (18%).

Mercury is a potent neurotoxin and can cause:

- Impairment of peripheral vision
- Disturbance in sensations
- Lack of coordination of movements
- Impairment of speech or hearing
- Muscle weakness

- Skin rashes
- Mood swings, mental disturbances
- Developmental-interferes w/ normal brain development; impaired memory, attention, and learning.

Airborne mercury eventually settles into bodies of water, then builds up in the bodies of fish. The Food and Drug Administration has advised pregnant women and women of childbearing age who may become pregnant about the hazards of consuming certain kinds of fish that may contain high levels of methyl mercury. It has also advised these women not to eat shark, swordfish, king mackerel, and tilefish and recommends that nursing mothers and young children not eat these fish as well. The NH Department of Health and Human Services has issued its own fish consumption advisory for freshwater fish, ocean fish and shellfish. This can be found at: can be found at:

www.dhhs.state.nh.us/DHHS/HLTHRISKASSESS/LIBRARY/Fact+Sheet/C3.htm

Food Safety

Food borne illness in the United States is a major cause of personal distress, preventable death and avoidable economic burden. It is estimated that food borne diseases cause approximately 76 million illnesses, 325,000 hospitalizations and 5,000 deaths in the US each year. For many victims, food borne illness results in lost time from work or major discomfort. For highly susceptible populations such as the immunocompromised, preschool children or older adults, food borne illness is more serious and may be life threatening. The estimated annual cost of food borne illness in terms of medical costs, reduced productivity, and pain and suffering is between $10 and $83 billion. Factors which contribute to the increase in food borne illness include changes in diet, new methods of food production, new infectious agents and an ever increasing at-risk populations. From the “farm to the table” there are numerous environmental factors that can affect the safety of the food supply including air, soil, water, animals, rodents, insects, ingredients, packaging materials, transport methods, contact surfaces, and food handlers.
The Commission learned of the efforts of the NH Department of Health and Human Services Bureau of Food Protection (BFP) to protect the food supply and prevent food borne illness in NH. The BFP is the state agency responsible for licensing and inspecting approximately 5,000 retail food establishments, dairy farms, milk and bottled water plants, and commercial shellfish processors.

Asthma /Pulmonary Disease

Much as it has throughout the United States, the incidence of asthma and respiratory disease in New Hampshire has been steadily increasing, and is considered a significant public health concern. Data from the 2000 Behavioral Risk Factor Surveillance System (BRFSS) indicate that the rates of self-reported asthma prevalence in New England are among the highest in the nation; and the rate of asthma in New Hampshire (8.3%) significantly exceeds the U.S. average of 7.2%.

New Hampshire is in the process of combating the public health threats posed by the asthma epidemic through a number of coordinated asthma intervention and prevention initiatives.

The New Hampshire Departments of Health and Human Services (DHHS), Environmental Services (DES), and Education, together with the Manchester Health Department, the NH Housing Finance Authority, the NH Lung Association, and NH Health Maintenance Organizations, have teamed with counterparts from the other New England states to form the New England Asthma Regional Council (ARC). With its participation in the ARC, NH is working to address asthma through a regional effort that includes initiatives to promote asthma surveillance, public education and outreach, and reducing exposures to factors that exacerbate asthma in homes, schools and communities.

In addition, NH DHHS, with support from DES and others, has recently been awarded a grant from the Centers for Disease Control and Prevention to develop and implement a statewide action plan for asthma. This effort has resulted in the recent formation and staffing of a new Asthma Control Program in the DHHS Office of community and Public Health, as well as a multi-stakeholder Asthma Advisory Council to direct the efforts of the program.

Pesticides, Children and School Integrated Pest Management (IPM)

There is increasing awareness and concern regarding the use of pesticides because of their potentially harmful effects on human health. Depending on the pesticide and on the dose, adverse health effects range from cancer, acute and chronic injury to the nervous system, lung damage, reproductive dysfunction, and damage to the endocrine and immune systems.

Children are at greater risk than are adults for both pesticide exposure and adverse effects. Simply stated, children breathe and ingest more pesticides relative to body weight than do adults. The behaviors of children also cause greater exposure to pesticides. They play on floors and on lawns and have greater (unwashed) hand to mouth contact. The 1993 National Research Council report, Pesticides in the Diets of Infants and Children, points to the heightened susceptibility of children to the toxicities of pesticides. The report stimulated a federal recognition of the need to reduce children's opportunity for pesticide exposure.

Children spend nearly one-third of their day in school. Despite studies linking pesticide exposure to both short and long term illness, there is a paucity of useful data regarding the use of pesticides in schools. Inadequate regulations and data collection infrastructures exist at both the federal and state levels.

Many pesticides have never been fully tested for the full range of potential human health effects. Pesticides registered prior to November 1984 remain on the market as they undergo re-registration evaluation, a process mandated by an amendment to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). New dimensions were added to this re-registration process with the passage of the Food Quality Protection Act (FQPA) in 1996. The FQPA requires the reassessment of "tolerances", the pesticide residues in food. The Environmental Protection Agency (EPA) must be able to conclude with "reasonable certainty" that "no harm"

will come to infants, children, or other sensitive individuals exposed to pesticides. All pesticide exposures -- from food, drinking water, and home and garden use -- must be considered in determining allowable levels of pesticides in food. The cumulative effects of pesticides and other compounds with common mechanisms of action also must be considered. The EPA has deemed the reassessment of the organophosphates, ubiquitous pesticides in agriculture, home and schools, a top priority. However, this reassessment is not scheduled for completion until 2006. The reassessment reviews of the synthetic pyrethroids are not even scheduled to begin until approximately 2004.

The 1999 GAO report, Pesticides: Use, Effects, and Alternatives to Pesticides in Schools, states that the data on the extent to which schoolchildren, and people in general, are experiencing short- or long-term illness and injuries due to pesticides are limited. A 1999 internal EPA memorandum states that underreporting is a known problem for pesticide poisoning surveillance systems in general and, thus, for incidents at schools. The EPA acknowledges the risk of pesticide exposure to children, yet it cannot provide information on the amount of pesticides used in schools, as there is no federal requirement that such data be collected.

Thirty-three states have already adopted pesticide acts or regulations that address the protection of children by focusing on pesticide use in, around and near schools, including our neighboring New England states of Massachusetts, Maine, Connecticut and Rhode Island. New Hampshire State laws and regulations have few references to the use of pesticides in schools. The State of New Hampshire does not collect data on the type and amount of pesticides used in schools despite the fact that commercial applicators are required by law to keep records of their use of specific pesticides, including the location of the site of application. The state does not have regulations requiring:

- buffer zones to restrict pesticide drift (except with aerial application),
- posting of signs in conjunction with indoor pesticide usage,
- mandated parental and staff notification prior to pesticide application, and
- the use of Integrated Pest Management (IPM) for schools.

Integrated Pest Management (IPM) is a process that advocates combined strategies that substitute or minimize toxic pesticides to manage pest damage with the least possible hazard to people, property, and the environment. "One of EPA's highest priorities is protecting children's health from unnecessary exposure to pesticides that are used in their schools to control pests. EPA is encouraging school officials to adopt IPM practices to reduce children's exposure to pesticides."

In 2002, The Jordan Institute, with the cooperation with the New Hampshire Department of Education, conducted a statewide survey of NH public schools regarding their pest management practices. The survey revealed a predominant reliance on the use of pesticides, the widespread absence of policies regarding pesticides usage, and a dearth of schools practicing IPM. This indicates the need for a proactive approach of broad-based education, specific training, and ultimately the alteration of some practices.

Smoking and the Tobacco Settlement in NH

According to the latest Youth Tobacco Survey (2000), the number of youth smokers in NH is still above the national average. The state of NH was recently awarded over 45 million dollars through the tobacco settlement money. Unfortunately, only 3 million of those dollars were allocated for tobacco prevention and cessation.

[1] A definition from "The Future of Environmental Health" referenced in an article by L.Gordon: Setting the Context: Environmental Health Practitioner Competencies" Journal of Environmental Health. July/Aug 2002. P.25-27